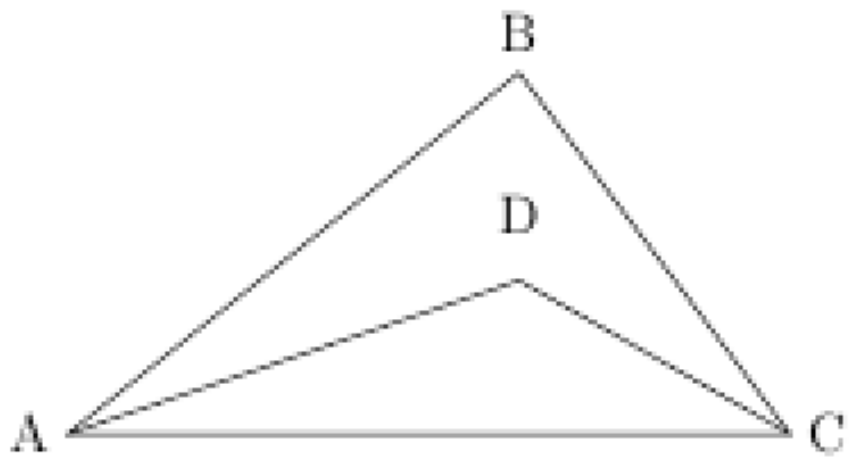
Topic: Perpendicular and angle bisectors

Question: Find the angle measure.

$\overline{AD}$ and $\overline{CD}$ are bisectors of $\angle BAC$ and $\angle BCA$ respectively. What is $m\angle D$?



$m\angle BAC = 39°$ and $m\angle BCA = 53°$

Answer choices:

A $88°$

B $112°$

C $123°$

D $134°$

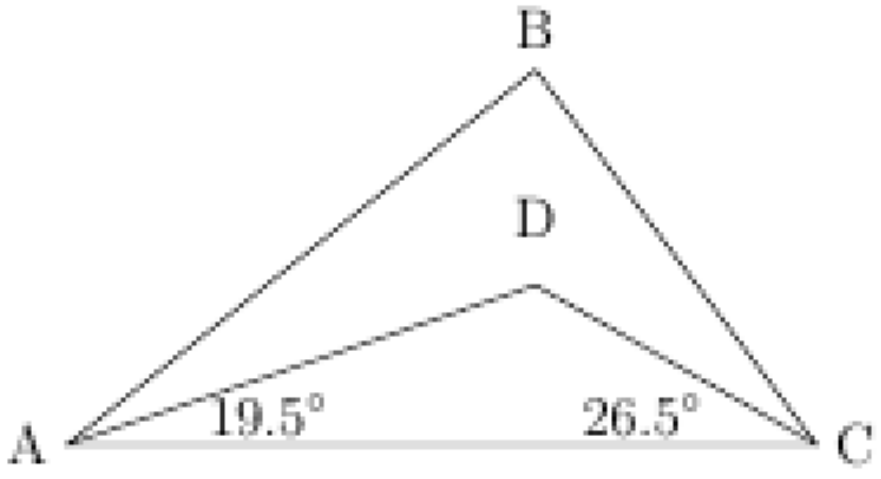
© Krista King Math

Solution: D

Using what we already know, we can say

$$m\angle DAC = \frac{1}{2}m\angle BAC = \frac{1}{2}(39^\circ) = 19.5^\circ$$

$$m\angle DCA = \frac{1}{2}m\angle BCA = \frac{1}{2}(53^\circ) = 26.5^\circ$$



The three angles of ΔADC (or any triangle) add up to 180°. Therefore,

$$19.5^\circ + 26.5^\circ + \angle D = 180^\circ$$

$$46^\circ + \angle D = 180^\circ$$

$$\angle D = 134^\circ$$

© Krista King Math

Topic: Perpendicular and angle bisectors

Question: The perpendicular bisector of a line segment does which of these things?

Answer choices:

A Forms at least two right angles

B Forms two equal length line segments

C Passes through the midpoint of the original segment

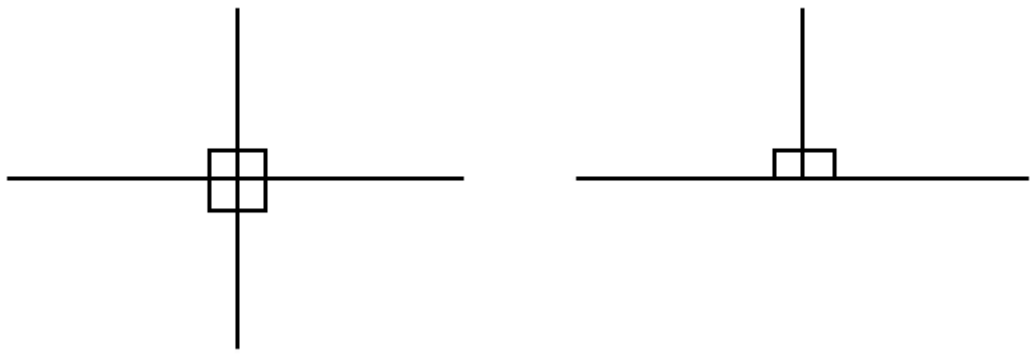
D All of these

© Krista King Math

Solution: D

All of these are true.

a) The figures above show how you could get two or four right angles.



b) The word bisector tells us that the segment is split into two equal parts.

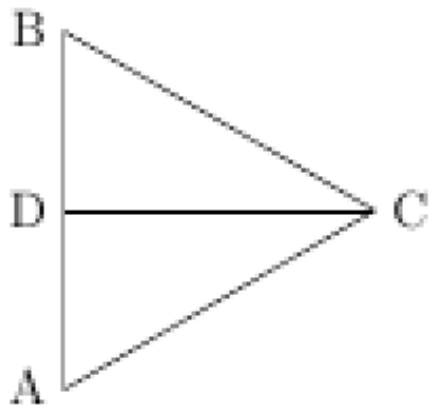
c) The point that divides a segment into two equal segments is the midpoint.

© Krista King Math

Topic: Perpendicular and angle bisectors

Question: Find the perimeter.

ΔABC is an equilateral triangle. $\overline{CD}$ is the perpendicular bisector of $\overline{AB}$. $AD = 5x - 2$ and $BD = 3x + 6$. What is the perimeter of ΔABC ?



Answer choices:

A 24

B 54

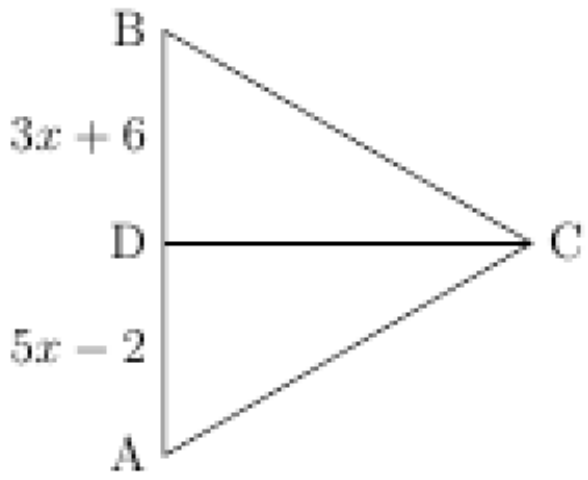
C 108

D 156

© Krista King Math

Solution: C

Let's label what we've been given.



Because $\overline{CD}$ bisects $\overline{AB}$,

$$3x + 6 = 5x - 2$$

$$8 = 2x$$

$$4 = x$$

Substituting 4 for x, we get

$$AB = 3(4) + 6 + 5(4) - 2$$

$$AB = 36$$

Therefore, the perimeter of ΔABC is

$$3 \cdot 36$$

$$108$$

© Krista King Math